

Amendments To The Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-56. (canceled)

57. (new) A mold component configured for use with a base mold in a closed molding process to form a fiber-reinforced composite part, the mold component comprising:

a flexible body structure including a perimeter region and an interfacing surface, at least a portion of said interfacing surface configured to contact said part disposed on said base mold, and said flexible body structure having integrally formed therewith:

at least one resin distribution channel extending across the interfacing surface and at least one vacuum distribution channel;

a perimeter seal extending from said body structure for sealing engagement with said base mold to enclose the part between said body structure and said base mold and wherein said perimeter seal defines at least a portion of said vacuum distribution channel; and

at least one vacuum output port in fluid communication with each of said vacuum distribution channel and said perimeter seal vacuum distribution portion thereby providing a first vacuum along said seal to assist said sealing engagement and an independent second vacuum across said interfacing surface to assist resin distribution between said body structure and said base mold.

58. (new) The mold component of claim 57, further comprising:

a standoff extending from said interfacing surface of said body structure;

and

a plurality of passages formed in said standoff to facilitate fluid communication between said at least one resin distribution channel and an enclosed space formed between said body structure and said base mold wherein said fiber-reinforced composite part may be formed.

59. (new) The mold component of claim 57, wherein said flexible body structure is formed by spraying a material on a pattern, said material being selected from the group consisting of polyurea, polyurethane, a polyurea/polyurethane compound, and mixtures thereof.

60. (new) The mold component of claim 59, wherein said material is further selected from the group consisting of aliphatic compounds, aromatic compounds, and polyaspartic compounds.

61. (new) The mold component of claim 57, wherein said perimeter seal comprises a grid of sidewall flanges.

62. (new) The mold component of claim 57, wherein said body structure further comprises first regions formed at said resin or vacuum distribution channels having increased rigidity as compared to the remainder of said body structure.

63. (new) The mold component of claim 62, wherein said first regions include a reinforcing material bonded with said body structure.

64. (new) The mold component of claim 57, wherein said body structure is formed of one or more materials thereby providing regions in said body structure with different physical properties.

65. (new) The mold component of claim 64, said physical properties being selected from the group consisting of density, rigidity, compression, elongation, and combinations thereof.

66. (new) The mold component of claim 57, further comprising at least one resin input port extending through said body structure and in fluid communication with at least one of said at least one resin distribution channel.

67. (new) The mold component of claim 57, wherein said perimeter seal comprises a plurality of perimeter seals extending downwardly from said body structure and defining a vacuum distribution channel therebetween.

68. (new) A mold component configured for use with a base mold in a closed molding process to form a fiber-reinforced composite part, the mold component comprising:

- a flexible body structure including a perimeter region and an interfacing surface, at least a portion of said interfacing surface configured to contact said part disposed on said base mold, and said flexible body structure having integrally formed therewith:

- at least one resin distribution channel and at least one vacuum distribution channel extending across the interfacing surface;

- a perimeter seal extending from said body structure for sealing engagement with said base mold to enclose the part between said body structure and said base mold and wherein said perimeter seal defines a vacuum distribution channel; and

- at least one vacuum output port in fluid communication with each of said interfacing surface vacuum distribution channel and said perimeter seal vacuum distribution channel thereby providing a first vacuum along said seal to assist said sealing engagement and an independent second vacuum across said interfacing surface to assist resin distribution between said body structure and said base mold.

69. (new) The mold component of claim 68, wherein said perimeter seal comprises a plurality of perimeter seals extending downward from said body structure and defining a vacuum distribution channel therebetween.

70. (new) The mold component of claim 68 wherein at least a portion of said interfacing surface is configured to contact said part disposed on said base mold, said mold component further comprising:

- a standoff extending from the interfacing surface of said body structure; and
- a plurality of passages formed in said standoff to facilitate fluid communication between said at least one resin distribution channel and an enclosed space formed

between said body structure and said base mold wherein said fiber-reinforced composite part may be formed.

71. (new) The mold component of claim 68, wherein said flexible body structure is formed by spraying a material on a pattern, said material being selected from the group consisting of polyurea, polyurethane, a polyurea/polyurethane compound, and mixtures thereof.

72. (new) The mold component of claim 71, wherein said material is further selected from the group consisting of aliphatic compounds, aromatic compounds, and polyaspartic compounds.

73. (new) The mold component of claim 68, wherein said perimeter seal comprises a grid of sidewall flanges.

74. (new) The mold component of claim 68, wherein said body structure further comprises first regions formed at said distribution channels having increased rigidity as compared to the remainder of said body structure.

75. (new) The mold component of claim 74, wherein said first regions include a reinforcing material bonded with said body structure.

76. (new) The mold component of claim 68, wherein said body structure is formed of one or more materials thereby providing regions in said body structure with different physical properties.

77. (new) The mold component of claim 76, said physical properties being selected from the group consisting of density, rigidity, compression, elongation, and combinations thereof.

78. (new) The mold component of claim 68, further comprising:
at least one resin input ports extending through said body structure and in fluid communication with at least one of said at least one resin distribution channel.

79. (new) A reusable mold component configured for use with a base mold in a closed molding process to form a fiber-reinforced composite part, the mold component comprising:

a flexible body structure formed by spraying material selected from the group consisting of polyurea, polyurethane, and polyurea/polyurethane on a pattern, said body structure including a perimeter region and an interfacing surface, at least a portion of said interfacing surface configured to contact said part disposed on said base mold, and said flexible body structure having integrally formed therewith:

at least one resin distribution channel extending across the interfacing surface and at least one vacuum distribution channel;

a perimeter seal extending from said body structure for sealing engagement with said base mold to enclose the part between said body structure and said base mold and wherein said perimeter seal defines at least a portion of said vacuum distribution channel; and

at least one vacuum output port in fluid communication with each of said vacuum distribution channel and said perimeter seal vacuum distribution portion thereby providing a first vacuum along said seal to assist said sealing engagement and an independent second vacuum across said interfacing surface to assist resin distribution between said body structure and said base mold.

80. (new) The mold component of claim 79, further comprising:

a standoff extending from said interfacing surface of said body structure;
and

a plurality of passages formed in said standoff to facilitate fluid communication between said at least one resin distribution channel and an enclosed space formed between said body structure and said base mold wherein said fiber-reinforced composite part may be formed.

81. (new) The mold component of claim 79, wherein said material is further selected from the group consisting of aliphatic compounds, aromatic compounds, and polyaspartic compounds.

82. (new) The mold component of claim 79, wherein said perimeter seal comprises a grid of sidewall flanges.

83. (new) The mold component of claim 79, wherein said body structure further comprises first regions formed at said resin or vacuum distribution channels having increased rigidity as compared to the remainder of said body structure.

84. (new) The mold component of claim 83, wherein said first regions include a reinforcing material bonded with said body structure.

85. (new) The mold component of claim 79, wherein said body structure is formed of one or more materials thereby providing regions in said body structure with different physical properties.

86. (new) The mold component of claim 85, said physical properties being selected from the group consisting of density, rigidity, compression, elongation, and combinations thereof.

87. (new) The mold component of claim 79, further comprising at least one resin input port extending through said body structure and in fluid communication with at least one of said at least one resin distribution channels.

88. (new) The mold component of claim 79, wherein said vacuum distribution channel extends across said interfacing surface.

89. (new) The mold component of claim 79, wherein said perimeter seal comprises a plurality of perimeter seals extending downwardly from said body structure and defining a vacuum distribution channel therebetween.

90. (new) A mold component configured for use with a base mold in a closed molding process to form a fiber-reinforced composite part, the mold component comprising:

a flexible body structure including a perimeter region and an interfacing surface, at least a portion of said interfacing surface configured to contact said part disposed on said base mold, and said flexible body structure having integrally formed therewith:

at least one resin distribution channel extending across the interfacing surface and at least one vacuum distribution channel;

a plurality of perimeter seals extending downwardly from said body structure for sealing engagement with said base mold to enclose the part between said body structure and said base mold and wherein said perimeter seals define at least a portion of said vacuum distribution channel; and

at least one vacuum output port in fluid communication with each of said vacuum distribution channel and said perimeter seal vacuum distribution portion thereby providing a first vacuum along said seal to assist said sealing engagement and an independent second vacuum across said interfacing surface to assist resin distribution between said body structure and said base mold.

91. (new) The mold component of claim 90, further comprising:
a standoff extending from said interfacing surface of said body structure;
and

a plurality of passages formed in said standoff to facilitate fluid communication between said at least one resin distribution channel and an enclosed space formed between said body structure and said base mold wherein said fiber-reinforced composite part may be formed.

92. (new) The mold component of claim 90, wherein said flexible body structure is formed by spraying a material on a pattern, said material being selected from the group consisting of polyurea, polyurethane, a polyurea/polyurethane compound, and mixtures thereof.

93. (new) The mold component of claim 92, wherein said material is further selected from the group consisting of aliphatic compounds, aromatic compounds, and polyaspartic compounds.

94. (new) The mold component of claim 90, wherein said perimeter seal comprises a grid of sidewall flanges.

95. (new) The mold component of claim 90, wherein said body structure further comprises first regions formed at said resin or vacuum distribution channels having increased rigidity as compared to the remainder of said body structure.

96. (new) The mold component of claim 95, wherein said first regions include a reinforcing material bonded with said body structure.

97. (new) The mold component of claim 90, wherein said body structure is formed of one or more materials thereby providing regions in said body structure with different physical properties.

98. (new) The mold component of claim 97, said physical properties being selected from the group consisting of density, rigidity, compression, elongation, and combinations thereof.

99. (new) The mold component of claim 90, further comprising at least one resin input port extending through said body structure and in fluid communication with at least one of said at least one resin distribution channel.

100. (new) The mold component of claim 57, wherein said perimeter seals define a vacuum distribution channel therebetween.

101. (new) A mold component configured for use with a base mold in a closed molding process to form a fiber-reinforced composite part, the mold component comprising:

a flexible body structure including a perimeter region and an interfacing surface, at least a portion of said interfacing surface configured to contact said part disposed on said base mold, and said flexible body structure having integrally formed therewith:

at least one resin distribution channel extending across the interfacing surface and at least one vacuum distribution channel;

a plurality of perimeter seals extending downwardly from said body structure for sealing engagement with said base mold to enclose the part between said body structure and said base mold and wherein said perimeter seals define a vacuum distribution channel therebetween; and

at least one vacuum output port in fluid communication with each of said vacuum distribution channel and said perimeter seal vacuum distribution portion thereby providing a first vacuum along said seal to assist said sealing engagement and an independent second vacuum across said interfacing surface to assist resin distribution between said body structure and said base mold.

102. (new) The mold component of claim 101, further comprising:

a standoff extending from said interfacing surface of said body structure; and

a plurality of passages formed in said standoff to facilitate fluid communication between said at least one resin distribution channel and an enclosed space formed between said body structure and said base mold wherein said fiber-reinforced composite part may be formed.

103. (new) The mold component of claim 101, wherein said flexible body structure is formed by spraying a material on a pattern, said material being selected from the group consisting of polyurea, polyurethane, a polyurea/polyurethane compound, and mixtures thereof.

104. (new) The mold component of claim 103, wherein said material is further selected from the group consisting of aliphatic compounds, aromatic compounds, and polyaspartic compounds.

105. (new) The mold component of claim 101, wherein said perimeter seal comprises a grid of sidewall flanges.

106. (new) The mold component of claim 101, wherein said body structure further comprises first regions formed at said resin or vacuum distribution channels having increased rigidity as compared to the remainder of said body structure.

107. (new) The mold component of claim 106, wherein said first regions include a reinforcing material bonded with said body structure.

108. (new) The mold component of claim 101, wherein said body structure is formed of one or more materials thereby providing regions in said body structure with different physical properties.

109. (new) The mold component of claim 108, said physical properties being selected from the group consisting of density, rigidity, compression, elongation, and combinations thereof.

110. (new) The mold component of claim 101, further comprising at least one resin input port extending through said body structure and in fluid communication with at least one of said at least one resin distribution channel.

111. (new) A process involving a closed molding tooling technique to form a fiber-reinforced composite part against a base mold with a flexible body structure having an interfacing surface upon which at least one resin distribution channel and at least one vacuum distribution channel are formed and extend thereacross, and at least one perimeter seal, the process comprising:

placing a fiber lay up on the base mold;

moving the body structure onto the base mold such that the fiber lay up is covered by the interfacing surface of the body, thereby forming an enclosed space between the body structure and the base mold, the fiber lay up being located in the enclosed space; and

drawing a first vacuum at said perimeter seal to cause said perimeter seal to sealingly engage the base mold; and

drawing a second vacuum independent from said first vacuum through said enclosed space thereby urging the resin to travel through the resin distribution channel and across and through the fiber lay up generally in the direction of the second vacuum draw to thereby form the composite part upon curing.

112. (new) A process of forming a boat involving closed molding tooling techniques to form a fiber-reinforced composite boat against a base mold with a flexible body structured having an interfacing surface corresponding to the shape of said composite boat upon which at least one resin distribution channel and at least one vacuum distribution channels are formed and extend thereacross and at least one perimeter seal, the process comprising:

forming a reusable unitary body structure by spraying material selected from the group consisting of polyurea, polyurethane, and polyurea/polyurethane on a pattern;

placing a fiber lay up on the base mold;

applying resin to the fiber lay up;

moving the unitary integral body structure onto the base mold such that the fiber lay up/resin combination is covered by the interfacing surface of the unitary integral body structure; and

drawing a first vacuum at said perimeter seal to cause said perimeter seal to sealingly engage the base mold; and

drawing a second vacuum independent from said first vacuum through said enclosed space thereby urging the resin to travel through the resin distribution channel and across and through the fiber lay up generally in the direction of the second vacuum draw to thereby form a composite boat upon curing.